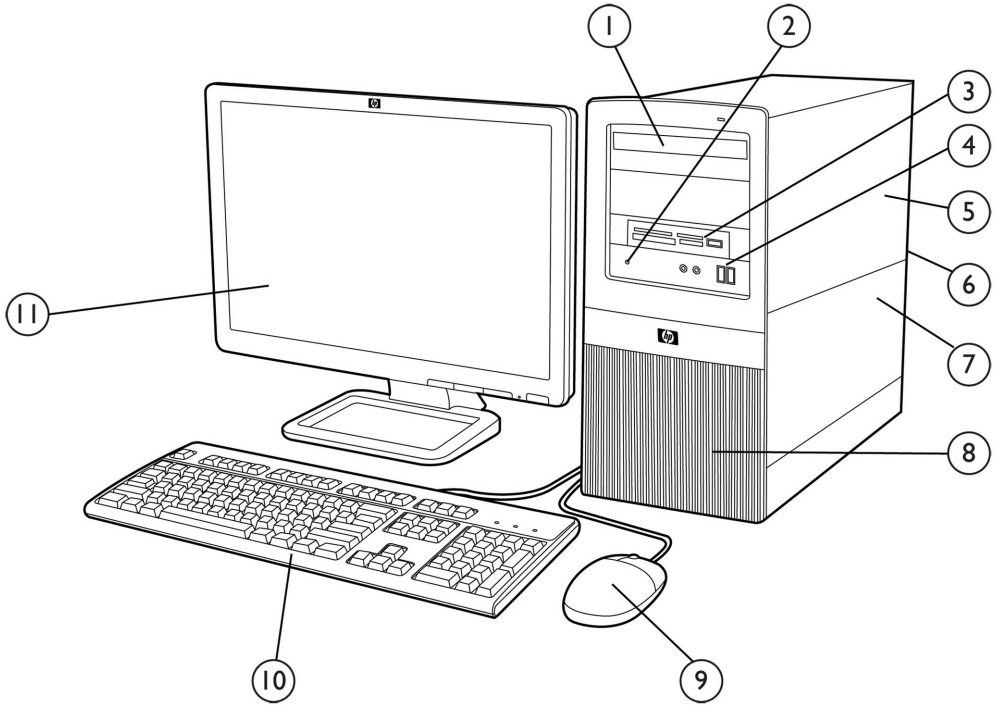
*Overview*

Microtower




1. (2) external 5.25" drive bays for optional optical drives
2. Reset/recovery button
3. (1) external 3.5" drive bay for optional media reader or Pocket Media drive
4. Front I/O includes: (2) USB 2.0 ports, dedicated headphone output, microphone jack
5 Standard efficiency Power Supply
6. Rear I/O includes: (6) USB 2.0 ports, serial port, PS/2 mouse and keyboard ports, RJ-45 network interface, DVI-D and VGA video interfaces, microphone jack, audio in/out jacks
7. (2) full-height PCI 2.3 slots, (1) PCIe x1 slot, (1) PCIe x16 slot
8. (2) internal 3.5" hard drive bays
9. PS/2 Scroll Mouse
10. HP Standard Keyboard
11. Monitor (sold separately)

*Overview*

## At A Glance

- Support for AMD Phenom™ II X2/X3/X4 multi-core processors and AMD Athlon™ II X2/X3/X4 multi-core processors
- Genuine Windows 7 versions, Genuine Windows Vista versions, Genuine Windows XP Professional available through downgrade rights from Windows 7 Professional, SuSE Linux Enterprise Desktop 11, or FreeDOS
- NVIDIA GeForce 9100 Chipset
- Legacy serial port support
- NVIDIA GeForce 9100 graphics controller with DX10 support
- PCI Express I/O bus
- Serial ATA controller
- Realtek 8111DL Gigabit Ethernet Controller
- Choice of hard drives and optical drives
- DDR3 SDRAM system memory
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

*Standard Features and Configurable Components (availability may vary by country)*

**Processor and Speed**
One of the following

AMD Athlon II X2 Dual-Core Processors:
AMD Athlon II X2 215 Processor (2.7-GHz, 1M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X2 240 Processor (2.8-GHz, 2M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X2 245 Processor (2.9-GHz, 2M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X2 250 Processor (3.0-GHz, 2M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X3 Triple-Core Processors:
AMD Athlon II X3 425 Processor (2.7-GHz, 1.5M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X3 435 Processor (2.9-GHz, 1.5M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X4 Quad-Core Processors:
AMD Athlon II X4 620 Processor (2.6-GHz, 2M L2 cache, 4000 GT/s System BUS)
AMD Athlon II X4 630 Processor (2.8-GHz, 2M L2 cache, 4000 GT/s System BUS)
AMD Phenom II X2 Dual-Core Processors:
AMD Phenom II X2 545 Processor (3.0-GHz, 7M L2+L3 cache, 4000 GT/s System BUS)
AMD Phenom II X2 550 Processor (3.1-GHz, 7M L2+L3 cache, 4000 GT/s System BUS)
AMD Phenom II X3 Triple-Core Processors:
AMD Phenom II X3 720 Processor (2.8-GHz, 7.5M L2+L3 cache, 4000 GT/s System BUS)
AMD Phenom II X4 Quad-Core Processors:
AMD Phenom II X4 820 Processor (2.8-GHz, 6M L2+L3 cache, 4000 GT/s System BUS)
AMD Phenom II X4 925 Processor (2.8-GHz, 8M L2+L3 cache, 4000 GT/s System BUS)
AMD Phenom II X4 945 Processor (3.0-GHz, 8M L2+L3 cache, 4000 GT/s System BUS)
AMD Phenom II X4 B95 Processor (3.0-GHz, 8M L2+L3 cache, 4000 GT/s System BUS)

**Operating Systems and Application Software**
(availability varies by region)

- Genuine Windows 7 Professional Edition (32-bit)[2]
- Genuine Windows 7 Professional Edition (64-bit)[2]
- Genuine Windows XP Professional available through downgrade rights from Windows 7 Professional [2,3]
- Genuine Windows 7 Home Premium Edition (32-bit or 64-bit)[2]
- Genuine Windows 7 Home Basic Edition (32-bit)[2]
- Genuine Windows 7 Starter2 (limited regions support, available in January 2010)
- Genuine Windows Vista Business (32-bit)[1]
- SuSE Linux Enterprise Desktop 11
- FreeDOS

[1] Certain Windows Vista product features require advanced or additional hardware. See www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: www.windowsvista.com/upgradeadvisor.

[2] System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

[3] Windows 7 Professional disk may be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is

expected to order at least 25 customer systems with the same custom image.

2007 Microsoft Office Ready PC
Microsoft Office 2007 Basic
Microsoft Office 2007 Small Business
Microsoft Office 2007 Professional
HP Recovery Manager
Mozilla Firefox for HP Virtual Solutions
Hard Disk Partitioning
Roxio Easy Media Creator 10**
Core WinDVD 8**
Core WinDVD BD for Blu-Ray**
McAfee Total Protection Anti-Virus***
PDF Complete
HP Power Manager v2.0 (Edison)
Credential Manager
HP Total Care Advisor
USB Port Disable
Sun Java Runtime Environment
Welcome Center SMB Offers

** Supporting software available with certain optical drive configurations
*** 60 day trial period for McAfee Total Protection for Small Business software. Internet access required to receive updates. First update included. Subscription required for updates thereafter.

---

**Hard Drives**

160-GB 7200 rpm Serial ATA 3.0-Gb/s NCQ, SMART
250-GB 7200 rpm Serial ATA 3.0-Gb/s NCQ, SMART
320-GB 7200 rpm Serial ATA 3.0-Gb/s NCQ, SMART
500-GB 7200 rpm Serial ATA 3.0-Gb/s NCQ, SMART

---

**System Memory**

1-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (1 x 1GB)
2-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (2 x 1GB)
2-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (1 x 2GB)
3-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (3 x 1GB)
3-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (1 x 1GB + 1 x 2GB)
4-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (4 x 1GB)
4-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (2 x 2GB)
4-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (1 x 4GB)
8-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (4 x 2GB)
8-GB DDR3 Synch DRAM PC3-10600 (1066/1333-MHz) Non-ECC (2 x 4GB)

NOTE: With some processors, memory runs at maximum speed of 1066 MHz. For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

---

*Standard Features and Configurable Components (availability may vary by country)*

| | |
|---|---|
| Storage - One or more of the following (see Storage section below) | Media Reader<br>HP 22-in-1 Media Card Reader<br>Optical Drives (Serial ATA)<br>SATA DVD-ROM Drive<br>SATA SuperMulti LightScribe DVD Writer<br>HP SATA Blu-ray Writer |
| Input Devices | Keyboard – One of the following<br>HP PS/2 Standard Keyboard<br>HP USB PS/2 Washable Keyboard<br>HP USB Standard Keyboard<br>HP USB Mini Keyboard<br>HP USB Smartcard Keyboard<br>Mouse – One of the following<br>PS/2 2-Button Optical Scroll Mouse<br>USB 2-Button Optical Scroll Mouse<br>USB 2-Button Laser Mouse |
| Audio | Realtek ALC662 High Definition audio codec<br>Internal PC speaker<br>HP USB Thin Powered Speakers |
| Communication | Realtek 8111DL GbE Ethernet Controller<br>Intel Gigabit CT Desktop NIC<br>LSI PCIe x1 56K International SoftModem<br>HP Wireless 802.11 b/g/n PCIe x1 Card |
| Graphics | NVIDIA GeForce 9100 Graphics Controller<br>ATI Radeon HD 4350 (512MB) FH PCIe x16 Card<br>ATI Radeon HD 4550 (256MB) DH PCIe x16 Graphics Card (available through January 2010)<br>ATI Radeon HD 4550 (512MB) DH PCIe x16 Graphics Card (available after January 2010)<br>ATI Radeon HD 4650 1GB Dual Head PCIe x16 Card<br>NVIDIA GeForce G210 512MB ATX PCIe x16<br>DMS-59 To Dual DVI Y-Cable Adapter |

*Standard Features and Configurable Components (availability may vary by country)*

| | |
|---|---|
| Miscellaneous | Hood Sensor<br>Port Control Cover<br>HP Chassis Security Kit<br>HP Parallel Port Adapter<br>HP Serial Port Full Height Adapter<br>HP Serial/Parallel PCI Card<br>HP 1394a FireWire 400 PCI Card |

*System Details*

**Base Unit**

- Micro ATX Microtower chassis, including power supply and front bezel; five (5) drive bays and four expansion slots
- Active type heatsink
- 92 x 92 x 25 mm chassis fan for Microtower chassis
- System board with NVIDIA GeForce 9100 chipset, Realtek RTL8111DL Ethernet controller, NVIDIA GeForce 9100 graphics, and Realtek audio
- (1) PCI Express x1 slot, (1) PCI Express x16 slot, (2) PCI slots, (4) DDR3 DIMM memory slots, (4) Serial ATA data connectors, (8) USB Ports (see USB support below), (1) VGA, (1) DVI-D port, (1) serial port in the rear IO
- Power cord

---

**Slots**

| | |
|---|---|
| **PCI** | One (1) PCI Express x1 slot on PCA<br>One (1) PCI Express x16 slot on PCA (for graphic cards)<br>Two (2) PCI slots on PCA |
| **Memory Expansion** | Four (4) DDR3 SDRAM DIMM slots (8 GB maximum memory support) |

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

---

**Bays**

| | |
|---|---|
| **Internal** | Two (2) 3.5-inch |
| **External** | Two (2) 5.25-inch; One (1) 3.5-inch |

---

**USB Support**

EHCI high-speed USB 2.0 controller

Two (2) front ports; Six (6) rear ports
Six (6) internal ports on system board:

- 2 for front ports
- 2 for media card reader
- 2 reserved for future upgrade

---

**Interfaces** (Legacy)

One (1) PS/2 keyboard port
One (1) PS/2 mouse port
One (1) analog VGA video port
One (1) DVI-D video port
One (1) serial port
One (1) line in; one (1) line out; one (1) microphone in
One (1) RJ45 network port

---

*System Details*

| | | |
|---|---|---|
| Weight & Dimensions | Chassis Dimensions (H x W x D) | 15.14 x 7.27 x 16.36 in<br>385 x 185 x 416 mm |
| | Packaged Dimensions (D x L x W) | 19.63 x 24.13 x 10.56 in<br>498.6 x 613 x 268.2 mm |
| | System Weight | 16.80 lb (7.62 kg) |
| | Shipping Weight | 24.77 lb (11.24 kg) |
| Technology and Features | Memory Type | PC3-10600 DDR3 SDRAM (1066/1333MHz) non-ECC<br>Up to 8 GB system memory standard |
| | NOTE: With some processors, memory runs at maximum speed of 1066 MHz. For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system. | |
| | Hard Drive Interfaces Supported | Serial ATA, NCQ support |
| Chassis | Front Panel | Power button<br>Power On LED<br>HDD Activity LED<br>Reset/recovery button* |
| | Cooling Solutions Supported | Power Supply Fan (variable speed)<br>Active heatsink (variable speed)<br>Chassis fan (variable speed) |
| | Slots Supported | Four (4) full-height expansion slots |
| | Front I/O | Two (2) USB 2.0 ports, Headphone, Mic |
| | Rear I/O | Standard Micro ATX I/O connectors, including six (6) USB 2.0 ports, serial ports |
| | Drive Bays | Two (2) 5.25-inch (13.335 cm) half height external<br>One (1) 3.5-inch (8.89 cm) half height external<br>Two (2) 3.5-inch half height internal |
| | Internal Speaker | For LANA region units; optional for APJ |
| | Security | Padlock loop<br>Kensington Lock Support<br>Noble Universal Clamp Lock Cable Kit<br>Port Control Cover supported |
| | Power Supply | 250W PFC HV immunity (410V/s) and 300W NPFC power supply with a 115v/230v line switch (varies by country/region) as Standard configuration for APJ and LANA regions respectively, and 300W PFC HV immunity (410V/s) with a 115v/230v line switch |
| | *Reset function will be set for China/Hong Kong/Korea; Recovery function will be set for all other regions. | |

*System Details*

**Unit Environment and Operating Conditions**

General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 4 in (10.2 cm) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

| | | |
|---|---|---|
| Temperature Range (MT) | Operating | 41° to 95° F (5° to 35° C) |
| | Non-operating | –22° to 149° F (–30° to 65° C) |
| Relative Humidity (MT) | Operating | 10% to 90% (non-condensing at ambient) |
| | Non-operating | 5% to 95% (non-condensing at ambient) |
| Maximum Altitude (MT) (unpressurized) | Operating | 10,000 ft (3048 m) |
| | Non-operating | 30,000 ft (9144 m) |

NOTE: Operating temperature is de-rated 1.0 deg C per 1000 ft (300 m) to 7500 ft (2286 m) above sea level, no direct sustained sunlight. Maximum rate of change is 7.5 deg C/Hr. The upper limit may be limited by the type and number of options installed.

**System Board**

| | |
|---|---|
| Processor | Supports AMD Phenom™ II X2/X3/X4 multi-core processors and AMD Athlon™ II X2/X3/X4 multi-core processors |
| Chipset | NVIDIA GeForce 9100 Chipset |
| Memory | DDR3 SDRAM |
| | 4 x DIMM slots |
| Integrated Graphics | NVIDIA GeForce 9100 graphics controller |
| Audio | Realtek ALC662 HD Audio compatible codec with two channel audio 3D audio compliant with AC'97 rev. 2.3 |
| LOM | Realtek RTL8111DL |
| Storage | Four Serial ATA interfaces |
| Expansion Slots | 1 x PCI Express x1 slots |
| | 1 x PCI Express x16 slot |
| | 2 x PCI slots |
| BIOS | SPI FLASH ROM |
| Industrial Standard | PCIe compliant |
| | USB 2.0 |
| Rear I/O Ports | 1 x PS/2 keyboard port |
| | 1 x PS/2 mouse port |
| | 6 x USB 2.0 ports |
| | 1 x RJ-45 10/100/1000 port |
| | 1 x serial port |
| | 1 x DVI-D video port |

*System Details*

| | |
|---|---|
| | 1 x DB 15-pin analog VGA port |
| | 3 x audio ports |
| On Board I/O Interfaces | 1 x ATX power connector |
| | 1 x +12V power connector |
| | 1 x Floppy connector |
| | 1 x LPC connector |
| | 1 x header (1 – 1x3) to support hood sensor |
| | 1 x COM2 header |
| | 1 x Parallel header |
| | 1 x Front panel connector, Switch, LED (ON/Flash/OFF) |
| | 2 x Fan headers for CPU, chassis, with voltage/fan speed control |
| | 1 x header (1 – 2x5 ) to support 2 USB 2.0 ports at front side |
| | 1 x header (1 – 2x5) to support USB Card Media Reader |
| | 1 x header (1 – 2x5) to support additional USB devices, such as mPMD |
| | 1 x header (1 – 1x2) to support one touch reset |
| | 1 x header (1 – 1x2) to support one touch recovery |
| | 1 x header to support 2 front (Headphone/Mic) audio ports |
| Board Size | Micro-ATX, PCB Size: 9.6 x 9.6 in (24.38 x 24.38 cm) |
| | 4-layer PCB with green color |
| Additional Features | Bootable without keyboard, mouse or monitor |
| | Keyboard/mouse/USB wake up |
| | Support S3, S4 and S5 |
| | ACPI status |
| | Hardware monitor capability |
| | CPU fan speed control |
| | One button reset/recovery* |
| | *Reset function will be set for China/Hong Kong/Korea; Recovery function will be set for the other regions |

| | |
|---|---|
| Network Interface | Realtek 8111DL GbE Ethernet Controller<br>Intel Gigabit CT Desktop NIC |
| Wireless | Wireless 802.11b/g/n PCIe Card (full height bracket) |
| Modem | LSI PCIe x1 56K International SoftModem |

*System Details*

| Power Supply | | |
|---|---|---|
| Model | 250W/300W PFC+HV | 300W Non-PFC |
| Standard Efficiency | N/A | N/A |
| Energy Efficient | N/A | N/A |
| Operating Voltage Range | 90 to 132VAC, or<br>180 to 264VAC | 90 to 132VAC, or<br>180 to 264VAC |
| Rated Voltage Range | 100 to 127VAC, or<br>200 to 240VAC | 100 to 127VAC, or<br>200 to 240VAC |
| Rated Line Frequency | 50/60 Hz | 50/60 Hz |
| Operating Line Frequency Range | 47 – 63 Hz | 47 – 63 Hz |
| Rated Input Current | 8A/4A | 8A/4A |
| 115V/230V Line switch | Yes | Yes |
| Rated Input Current with Energy Efficient* Power Supply | N/A | N/A |
| Current Leakage (NFPA 99) | <3.5mA | <3.5mA |
| System Heat Dissipation | 250W:<br>48.5 W or 165.482 BTU/hr.(For 115V/60Hz)<br>48.2 W or 164.4584 BTU/hr. (For 30V/50Hz)<br>300W:<br>50.4W or 171.9648 BTU/hr. (For115V/60Hz)<br>50.3W or 171.6236 BTU/hr.(For 230V/50Hz) | 51.8W or 176.7416 BTU/hr.(For 115V/60Hz)<br>52W or 177.424 BTU/hr.(For 230V/50Hz) |
| System Heat Dissipation with Energy Efficient* Power Supply | N/A | N/A |
| Power Supply Fan | 80mm variable speed | 80mm variable speed |
| FEMP Standby Power Compliant (<2W in S5 - Power Off)* | 250W:<br>0.45W (For 115V/60Hz)<br>0.53W (For 230V/50Hz)<br>300W:<br>0.65W (For 115V/60Hz)<br>0.71W (For 230V/50Hz) | 0.61W (For 115V/60Hz)<br>0.69W (For 230V/50Hz) |
| Power Consumption in ES Mode - Suspend to RAM (S3) (Instantly Available PC) | <3W | <3W |
| High voltage immunity | up to 410V/s | N/A |
| China Telecom YD/T 993-2006 spec | Yes | N/A |

**System Environmental Specs**

- Values are subject to change without notification and are for reference only.
- Performance of system, options, and ancillary equipment will vary depending on the system configuration.
- Levels presented do not account for non-HP/Compaq installed hardware.

*System Details*

| | | |
|---|---|---|
| Ambient Air Temperature | Operating | Operating 41° to 95°F (5 to 35°C) (Test 0 to 104°F (40°C));<br>with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 10000 ft (3048 m), no direct sustained sunlight. Maximum rate of change is 50°F/Hr (10°C/Hr). The upper limit may be limited by the type and number of options installed. |
| | Storage | Storage: 90% RH @ 60°C for 12 hours (Non-condensing) |
| Humidity | Operating | 10% to 90% relative humidity (Rh), 35°C non-condensing |
| | Storage | 90% relative humidity (Rh), 60°C for 12 hours, non-condensing |
| Altitude | Operating | 0 to 10,000 feet (0 to 3048 meters) – This value may be limited by the type and number of options installed. |
| | Non-Operating | 0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min). |
| Shock | Listed are the levels of vibration the product can withstand with No damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range. | |
| | Non-Operating | 35G's (Half-sine Shock)<br>30G's (Trapezoidal Shock) |
| Vibration | Listed are the levels of vibration the product can withstand with No damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range. | |
| | Operating | Random vibration at 5Hz@0.00025$G^2$/Hz, 10Hz@0.01$G^2$/Hz, 100Hz@0.01$G^2$/Hz, 300Hz@0.00001$G^2$/Hz<br>5Hz to 300Hz, (0.25G's nominal). |
| | Non-Operating | ~2.09Grms (5-500Hz), Non-Operational |
| Acoustic Noise | Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 73.4°F (23°C) ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). | |
| | IDLE (Fixed disk drive spinning) | LWAd = 4.3 Bels,<br>Desktop Average LpAm = 32 dBA |
| | FIXED DISK (Random write) | LWAd = 4.4 Bels,<br>Desktop Average LpAm = 33 dBA |
| | DVD-ROM (Sequential Reads) | LWAd = 5.5 Bels,<br>Deskside Average LpAm = 44 dBA |

**Service and Support**

On-site Warranty[Note 1]: 1-1-1, 3-1-1, 3-3-3, 3-3-3 limited, 4-4-4, 5-5-5 limited warranty delivers on-site, next business-day[Note 2] service for parts and labor and includes free telephone support[Note 3] 24 x 7. Global coverage[Note 2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. One-year onsite and labor are not available in all countries.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical telephone support applies only to HP-configured Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

*After-Market Options (availability may vary by country)*

| | | |
|---|---|---|
| Communications | NICs | |
| | Intel Gigabit CT Desktop NIC | FH969AA |
| | Wireless LAN | |
| | HP Wireless 802.11/b/g/n PCIe x1 | FH971AA |
| | Modems | |
| | LSI PCIe x1 56K International SoftModem | FH970AA |
| Hard Disk Drives | HP 500-GB SATA 3.0-Gb/s Hard Drive | KW347AA |
| | HP 320-GB SATA 3.0-Gb/s Hard Drive | FH963AA |
| | HP 250-GB SATA 3.0-Gb/s Hard Drive | PY278AA |
| | HP 160-GB SATA 3.0-Gb/s Hard Drive | PY277AA |
| Removable Storage Devices | HP 22-in-1 Media Card Reader | AR941AA |
| Input Devices | Keyboards | |
| | HP PS/2 JB Standard Keyboard | DT527A |
| | HP USB JB Standard Keyboard | DT528A |
| | HP USB Smartcard Keyboard (Carbonite/Silver) | ED707AA |
| | HP Promo - USB PS2 Washable Keyboard | VF097AT#xxx |
| | HP Promo 2.4GHz Wireless Keyboard & Mouse | TBD |
| | HP 2.4GHz Wireless Keyboard & Mouse | TBD |
| | Mice | |
| | HP PS/2 2-Button Optical Scroll Mouse | EY703AA |
| | HP USB 2-Button Optical Scroll Mouse | DC172B |
| | HP USB 2-Button Laser Mouse | GW405AA |
| I/O Adapter | HP Serial/Parallel PCI Card (MT only) | KD062AA |
| | HP Parallel Port Adapter | KD061AA |
| | HP 2nd Serial Port Adapter | PA716A |
| | HP FireWire / IEEE 1394 PCI Card | PA997A |
| | Belkin Serial to USB adapter | EM449AA |
| Memory | HP 1GB PC3-10600 (DDR3-1333) DIMM | AT023AA |
| | HP 2GB PC3-10600 (DDR3-1333) DIMM | AT024AA |
| | HP 4GB PC3-10600 (DDR3-1333) DIMM | VH638AA |

*After-Market Options (availability may vary by country)*

| | | |
|---|---|---|
| Audio | HP Thin USB Powered Speakers | KK912AA |
| Graphics | ATI Radeon HD 4550 (256MB DH) PCIe x16 Graphics Card | AT042AA |
| | ATI Radeon HD 4550 (512MB) DH PCIe x16 Graphics Card | SG764AA |
| | ATI Radeon HD 4650 DP (1GB) PCIe x16 Graphics Card | VN566AA |
| | NVIDIA GeForce G210 HDMI (512MB) SH PCIe x16 Graphics Card | VN565AA |
| | NVIDIA GeForce GT230 1.5GB PCIe x16 Graphics Card | VH697AA |
| | HP DMS59 DVI Dual-head Connector Cable | DL139A |
| | HP DVI to DVI Cable | DC198A |
| Optical Drives | HP 16X/48X SATA DVD-ROM Drive BLK | AR629AA |
| | HP 16X SATA SuperMulti LightScribe DVD Drive BLK | AR630AA |
| | HP 16X SATA Blu-ray Writer BLK | AR482AA |
| Security | HP Business PC Security Lock Kit | PV606AA |
| | HP/Kensington MicroSaver Security Cable Lock | PC766A |
| | HP Chassis (dc) Security Kit | AR639AA |

*Memory*

DDR SYNCH DRAM NON-ECC MEMORY

The NVIDIA GeForce 9100 chipset supports non-ECC DDR3 memory up to PC3-10600 (1333 MHz). With some processors, memory runs at maximum speed of 1066 MHz. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

CAUTION: You must shut down the computer **and disconnect the power cord** before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

**HP recommends dual-channel symmetric configurations for maximum performance.**

For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

STANDARD MEMORY

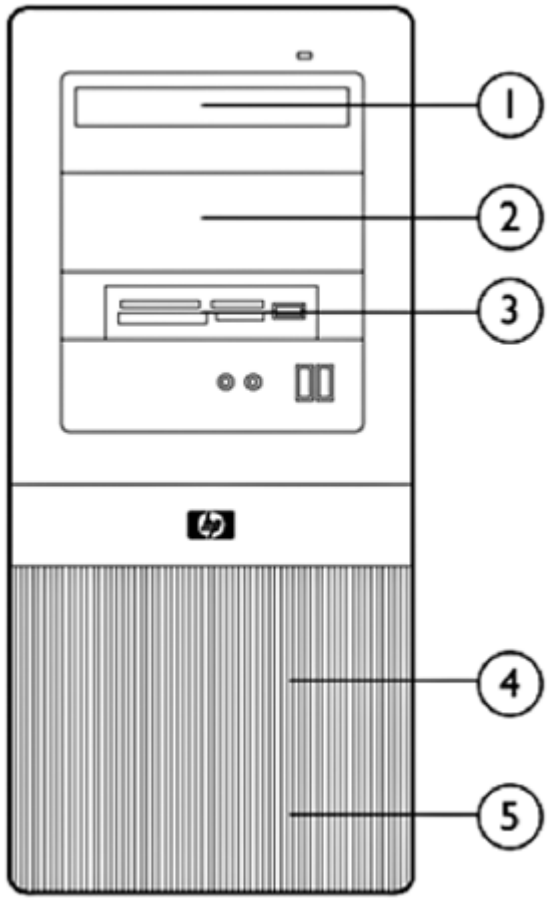
1-GB, 2-GB, 4-GB DDR3 SYNCH DRAM

OPTIONAL MEMORY UPGRADES

Supports up to 8-GB of DDR3 SYNCH DRAM. Not all memory configurations possible are represented below.

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

| DIMM Size | Slot 1 (White) | Slot 2 (Black) | Slot 3 (White) | Slot 4 (Black) |
|---|---|---|---|---|
| 1-GB | 1-GB | | | |
| 2-GB (dual-channel symmetric) | 1-GB | | 1-GB | |
| 2-GB | 2-GB | | | |
| 3-GB | 1-GB | | 2-GB | |
| 3-GB | 1-GB | 1-GB | 1-GB | |
| 4-GB | 4-GB | | | |
| 4-GB (dual-channel symmetric) | 1-GB | 1-GB | 1-GB | 1-GB |
| 4-GB (dual-channel symmetric) | 2-GB | | 2-GB | |
| 8-GB (dual-channel symmetric) | 4-GB | | 4-GB | |
| 8-GB (dual-channel symmetric) | 2-GB | 2-GB | 2-GB | 2-GB |




HP Pro 3005 Microtower Business PC

| | Maximum Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| **Drive Support** | | | |
| Media Reader | 1 | 3 | Internal USB 2.0 port |
| Diskette Drive | 1 | 3 | FDD |
| DVD-ROM Drives | 2 | 1, 2 | SATA |
| SuperMulti LightScribe Drives | 2 | 1, 2 | SATA |
| Blu-Ray JB Writer | 2 | 1, 2 | SATA |
| 3.5″ Serial ATA Hard Drives | 2 | 4, 5 | SATA |

*Technical Specifications*

| | | |
|---|---|---|
| Integrated Realtek ALC662-GR Audio | Type | Integrated |
| | HD Audio compatible codec | Yes |
| | Sampling (DAC and ADC) | Supports 44.1/48/96 KHz |
| | Audio Jacks | Mic-In |
| | | Line-In |
| | | Line-Out / Headphone Out |
| | Power Support | Digital: 3.3V |
| | | Analog: 5V |
| | Other | Meets Mircrosoft Windows Vista (WLP 3.08) Premium requirements<br>High-performance DACs with 98dB SNR(A-Weighting)<br>ADCs with 90dB SNR(A-Weighting) |
| Integrated Realtek 8111DL-VB-GR GbE Ethernet Controller | Connector | RJ45 |
| | Controller | Realtek 8111DL-VB-GR Gigabit Ethernet Controller |
| | Memory | Transmit/Receive on-chip buffer support |
| | Data rates supported | 2.5GHz data rate with X1 link width. |
| | Compliance | IEEE 802.1P, 802.1Q, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | Bus architecture | PCI Express 1.1 |
| | Data transfer mode | DMA |
| | Power requirement (LOM) | 1000mbps (TxRx) max.568mW<br>1000mbps (TxRx) idle.498mW<br>100mbps (TxRx) max.274mW<br>1000mbps (TxRx) idle.224mW<br>10mbps (TxRx) max.330mW<br>10mbps (TxRx) idle.155mW<br>D3 hot with Link (10M) 155 mW<br>D3 hot without Link 76 mW<br>D3 cold with Link (10M) 109 mW<br>D3 cold without Link with WoL 30 mW<br>D3 cold without Link with WoL 3 mW |
| | Network transfer rate | 10/100/1000 Mbps over CAT.5 |
| | | 10 Mbps over CAT.3 |
| | Dimensions | 7mm x 7mm |
| | Power Management | ACPI rev 2.0, PCI PM rev 1.1, ASPM L0s/L1 |
| | Connector | RJ45 |

*Technical Specifications*

| | | |
|---|---|---|
| Intel Gigabit CT Desktop NIC | Connector | RJ-45 |
| | Controller | Intel WG82574L Gigabit Ethernet Controller |
| | Memory | Integrated Dual 48K configurable transmit receive FIFO Buffers |
| | Data rates supported | 10/100/1000 Mbps |
| | Compliance | IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | Bus architecture | PCI-E 1.0a |
| | Data path width | X1, 250 MB/s, Bi-directional interface |
| | Data transfer mode | Bus-master DMA |
| | Hardware certifications | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | Power requirement | Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T |
| | Boot ROM support | Yes |
| | Network transfer rate | 10BASE-T (half-duplex) 10 Mbps |
| | | 10BASE-T (full-duplex) 20 Mbps |
| | | 100BASE-TX (half-duplex) 100 Mbps |
| | | 100BASE-TX (full-duplex) 200 Mbps |
| | | 1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus) |
| | Environmental | Operating temperature 32° to 131°F (0° to 55° C) |
| | | Operating humidity 85% at 131° F (55° C) |
| | Dimensions | 4.75 x 2.25 x 0.8 in (12.1 x 5.7 x 2.0 cm) |
| | Management capabilities | WOL, PXE, DMI, WFM 2.0 |

| | | |
|---|---|---|
| LSI PCIe x1 56K International SoftModem | Data Transmission | Technology speeds: 56,000 Kbps maximum downstream data, controllerless<br>NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions. |
| | Data Speeds | (Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 |
| | Data Standards | ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103 |
| | Fax Speeds | 14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s |
| | Fax Mode Capabilities | ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2 |
| | Error Correction and Data Compression | V.44, 42bis, V.42 and MNP2-5 |
| | Power Management | PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard. |
| | Upgradeability | Driver upgradeable for future enhancements |
| | Video | ITU-T V.80 video ready interface |

| | |
|---|---|
| Other | TIA/EIA 602 standard AT command set |
| | Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface |
| | Optional ring wakeup signal |
| Operating Temperature | 32° to 158° F (0° to 70° C) |
| Operating Humidity | 20% to 90%, non-condensing |
| Power | Requires a 3.3-V auxiliary power rail on PCI express bus |
| | Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load |
| Chipset | LSI SV92EX - Integrated PCI interface with 3.3-V tolerant buffers and CardBus support |
| Dimensions (L X H) | Complies with PCI express low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets |
| Connection | Single RJ-11 connector |
| Other Features | Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support |
| Safety | UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark |
| EMC | FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8 |
| Telecom | FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals<br>Not available in Korea or the Republic of South Africa. |
| Other | The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant. |

| | |
|---|---|
| HP Wireless 802.11 b/g/n PCIe Card | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13112_na/13112_na.html (Worldwide) |

| | |
|---|---|
| DMS-59 to Dual DVI Cable | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12845_na/12845_na.html (Worldwide) |

*Technical Specifications*

| | | |
|---|---|---|
| Integrated NVIDIA GeForce® 9100 DirectX 10 graphics processor | 3D/2D Controller | DX10 Graphics Processor |
| | Display Controller | Dual Head Display with Integrated DAC for CRT display |
| | Bus Type | PCIex16 |
| | RAMDAC | 300 MHz RAMDAC |
| | Memory | Up to 256MB of System Memory |
| | Controller Clock Speed | Internal 400MHz |
| | Maximum Color Depth | Analog VGA: 1920 × 1200 @ 75 Hz |
| | Multi-display Support | Yes |
| | Graphics/Video API Support | Microsoft DirectX10, NVIDIA CineFX® 4.0 Shading Architecture, OpenGL 2.0 |

Resolutions Supported[1]

| Resolution | Maximum Refresh Rate (Hz) | |
|---|---|---|
| | Analog Monitor | Digital Monitor |
| 800x600 | 75 | 60 |
| 1024x768 | 75 | 60 |
| 1280x1024 | 75 | 60 |
| 1600x1200 | 75 | 60 |
| 1920x1080 | 75 | 60 |
| 1920x1200 | 75 | 60 |
| NOTE: Other resolutions and refresh rates may be selectable but are not recommended. | | |

| | | |
|---|---|---|
| NVIDIA G210 (512MB) PCIe x16 Card | Form Factor | ATX Full Height |
| | Display max resolution | Analog VGA: 2048x1536x32bpp @ 75Hz &1920x1440x32bpp @ 75Hz<br>DVI: 2560x1600x32bpp @ 75Hz<br>HDMI: 1920x1200x32bpp @ 100Hz |
| | Input/Output connectors | Dual-Link DVI-I/VGA/HDMI |
| | Board configuration | Specification: Description |
| | | Graphics Chip: NVIDIA D10M1 |
| | | Core clock: 600 MHz |
| | | Memory clock: 500 MHz |
| | | Frame buffer: 512 MB DDR2, 192bit |
| | Compliance standards | EMC Emissions: |

- FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use
- CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment
- Canadian Standard ICES-003 is equivalent to CISPR22
- Japanese VCCI
- Taiwanese Standard BSMI
- Australian C-Tick
- Korean (KCC)

EMC Immunity:

| | |
|---|---|
| | CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement. |
| Core power | 21 W (Max board power) |

NVIDIA G210 (512 MB) PCIe x16 Graphics Controller display resolutions and refresh rates

NOTE:

- Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP
- All standard VGA text/graphics modes are supported in addition to table below.
- All modes not highlighted are selectable Windows® desktop modes. Highlighted modes should not be selectable as Windows® desktop modes (they are for DirectX™)
- All modes up to and including 1600x1200 must support the video overlay at all refresh rates.

| Analog Resolution | Depth(bpp) | CRT Maximum Refresh Rate (Hz) | VGA AND DVI-A (ANALOG) | DVI-I (DIGITAL) | HDMI |
|---|---|---|---|---|---|
| 640 x 480 | 16, 32 | 60, 72, 75, 85, 90, 100, 120, 160 | X | X | X |
| 800 x 600 | 16, 32 | 48, 56, 60, 70, 72, 75, 85, 90, 100, 120, 160 | X | X | X |
| 848x480 | 16, 32 | 60, 88 | X | X | X |
| 1024 x 768 | 16, 32 | 46, 60, 70, 72, 75, 85, 90, 100, 120 | X | X | X |
| 1152x864 | 16, 32 | 43, 47, 60, 70, 75, 80, 85, 100 | X | X | X |
| 1280x720 | 16, 32 | 60, 70, 75, 80, 85, 90, 100 | X | X | X |
| 1280x768 | 16, 32 | 60, 70, 75, 80, 85, 90, 100 | X | X | X |
| 1280 x 1024 | 16, 32 | 43, 47, 60, 70, 74, 75, 85, 90, 100 | X | X | X |
| 1600 x 1200 | 16, 32 | 52, 58, 60, 66, 70, 72, 75, 76, 85 | X | X | X |
| 1768x1344 | 16, 32 | 60, 75 | X | X | X |
| 1800x1440 | 16, 32 | 60, 65, 75 | X | X | X |
| 1856x1392 | 16, 32 | 60, 75 | X | X | X |
| 1920 x 1080 | 16, 32 | 60, 70, 75, 80, 85, 90, 100 | X | X | X |
| 1920 x 1200 | 16, 32 | 60, 72, 75, 76 80, 85, 90, 100 | X | X | X |
| 1920 x 1440 | 16, 32 | 60, 75 | X | X | NA |
| 2048 x 1536 | 16, 32 | 60, 66, 70, 75 | X | X | NA |
| 2560 x 1600 | 16, 32 | 60, 75 | NA | X | NA |

ATI Radeon HD 4350 HDMI (512MB) SH PCIe x16 Graphics Card

| | |
|---|---|
| Input/Output connectors | Dual-link DVI-I/VGA/HDMI |
| Display max resolution | Analog VGA: 1920x1200x32bpp @ 60Hz<br>DVI: 1920x1200x32bpp @ 60Hz<br>HDMI: 1920x1200x32bpp @ 60Hz |
| Display support | Integrated 400 MHz RAMDAC |
| Bus type | PCI Express (x16 lanes) |

| Board configuration | Specification | Description |
|---|---|---|
| | Graphics Chip | RV710D2 |
| | Core clock | 600 MHz |
| | Memory clock | 500 MHz |
| | Frame buffer | 512 MB DDR2, 64 bit wide |
| Languages supported | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish | |
| Core power | 23 W | |
| Compliance standards | EMC Emissions: | |

a. FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use
b. CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment
c. Canadian Standard ICES-003 is equivalent to CISPR22
d. Japanese VCCI
e. Taiwanese Standard BSMI
f. Australian C-Tick
g. Korean (KCC)

EMC Immunity:
CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement.

ATI HD4350 (512 MB) PCIe x16 Graphics Controller display resolutions and refresh rates

NOTE:

- Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP
- All standard VGA text/graphics modes are supported in addition to table below.
- All modes not highlighted are selectable Windows® desktop modes. Highlighted modes should not be selectable as Windows® desktop modes (they are for DirectX™)

All modes up to and including 1600x1200 must support the video overlay at all refresh rates.

*Technical Specifications*

| Analog Resolution | Depth(bpp) | CRT Maximum Refresh Rate (Hz) - VGA AND DVI-A (ANALOG) | CRT Maximum Refresh Rate (Hz) - DVI-I (DIGITAL) | CRT Maximum Refresh Rate (Hz) - HDMI |
|---|---|---|---|---|
| 800 x 600 | 16, 32 | 60, 75 | 60, 75 | 60, 75 |
| 1024 x 768 | 16, 32 | 60, 75 | 60, 75 | 60, 75 |
| 1152x648 | 16, 32 | NA | NA | 59, 60 |
| 1152x864 | 16, 32 | NA | 60, 75 | 59, 60 |
| 1280x720 | 16, 32 | NA | 60 | 50, 59, 60 |
| 1280x768 | 16, 32 | 75 | 60, 75 | 60, 75 |
| 1280x960 | 16, 32 | 60 | 60 | 60 |
| 1280 x 1024 | 16, 32 | 60, 75 | 60, 75 | 60, 75 |
| 1440x900 | 16, 32 | 60 | 60 | 60 |
| 1600 x 1200 | 16, 32 | 60 | 60 | 60 |
| 1680x1050 | 16, 32 | 60 | 60 | 60 |
| 1920 x 1080 | 16, 32 | NA | 59, 60 | 50, 59, 60 |
| 1920 x 1200 | 16, 32 | 59, 60 | 59, 60 | 59, 60 |

**ATI Radeon HD 4550 (256MB DH) PCIe x16 Graphics Card**

| | |
|---|---|
| Input/Output connectors | DMS-59<br>S-video connector |
| Board display options | Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output |
| Display max resolution | 1900 x 1200 digital, 2048 x 1536 analog |
| Display support | Integrated 400 MHz RAMDAC |
| Bus type | PCI Express (x16 lanes) |
| Maximum vertical refresh rate | 85 Hz |

| Board configuration | Specification | Description |
|---|---|---|
| | Graphics Chip | RV710 |
| | Core clock | 600 MHz |
| | Memory clock | 800 MHz |
| | Frame buffer | 256 MB DDR2, 64 bit wide |

| | |
|---|---|
| Languages supported | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish |
| Operating systems support | Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32*.<br>* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.<br>Linux x86 and x86_64 distributions using XFree86 or X.Org**.<br>** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: |

http://www.hp.com/wwsolutions/linux/products/clients/ for support information

**Core power** 21 W

**Option kit contents**

- ATI Radeon HD 4550 DH PCIe x16 Graphics Card with full height bracket attached;
- DMS 59 to dual VGA Y cable;
- Software CD with graphics drivers;
- Low profile bracket to convert the card for using in a low profile chassis;
- Warranty documentation;

**Compliance standards** EMC Emissions:

a. FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use
b. CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment
c. Canadian Standard ICES-003 is equivalent to CISPR22
d. Japanese VCCI
e. Taiwanese Standard BSMI
f. Australian C-Tick
g. Korean (MIC)

EMC Immunity:
CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement.

**ATI Radeon HD 4550 DH PCIe x16 Graphics Card display resolutions and refresh rates**

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

| Resolution | Maximum Refresh Rate (Hz) | |
|---|---|---|
| | Analog Connection | Digital Connection |
| 640x480 | 85 | 60 |
| 800x600 | 85 | 60 |
| 1024x768 | 85 | 60 |
| 1280x720 | 85 | 60 |
| 1280x1024 | 85 | 60 |
| 1440x900 | 75 | 60 |
| 1600x1200 | 85 | 60 |
| 1680x1050 | 75 | 60 |
| 1920x1080 | 85 | 60-R |
| 1920x1200 | 85 | 60-R |
| 1920x1440 | 85 | N/A |
| 2048x1536 | 75 | N/A |
| 2560x1600 | N/A | N/A |

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

**Languages supported** 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

**Operating systems** Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic

| | |
|---|---|
| support | 32*, Windows XP Professional or Windows XP Home 32*.<br><br>* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.<br><br>Linux x86 and x86_64 distributions using XFree86 or X.Org**.<br><br>** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information. |
| Core power | 21 W |
| Option kit contents | • ATI Radeon HD 4550 DH PCIe x16 Graphics Card with full height bracket attached<br>• DMS 59 to dual VGA Y cable<br>• Software CD with graphics drivers<br>• Low profile bracket to convert the card for using in a low profile chassis<br>• Warranty documentation |
| Compliance standards | EMC Emissions:<br>a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use<br>b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment<br>c) Canadian Standard ICES-003 is equivalent to CISPR22<br>d) Taiwanese Standard BSMI<br>e) Japanese VCCI<br>f) Australian C-Tick<br>g) Korean (KCC)<br><br>EMC Immunity:<br>CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement. |

**ATI Radeon HD 4650 (1GB DH) PCIe Graphics Card**

| | | |
|---|---|---|
| Bus type | PCI Express (x16 lanes) | |
| Maximum vertical refresh rate | 85 Hz | |
| Display support | Dual 400 MHz integrated RAMDACs | |
| Display max resolution | 2560 x 1600 digital, 2048 x 1536 analog | |
| Board display options | Supports two displays through any combination of two of the three output ports. | |
| Board configuration | Specification | Description |
| | Graphics Chip | RV730Pro |
| | Core clock | 600MHz |
| | Memory clock | 500 MHz |
| | Frame buffer | 1 GB DDR2, 128 bit wide |
| Maximum power | 55 W | |

| | |
|---|---|
| Languages supported | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish |
| Operating systems support | Windows Vista Home Basic 32*, FreeDOS<br>* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.<br>Linux x86 and x86_64 distributions using XFree86 or X.Org**<br>** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information. |
| Core power | 55 W |
| Compliance standards | EMC Emissions:<br>a) CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment<br><br>EMC Immunity:<br>CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement. |
| Board display options | Supports two displays through any combination of two of the three output ports. |

Board configuration

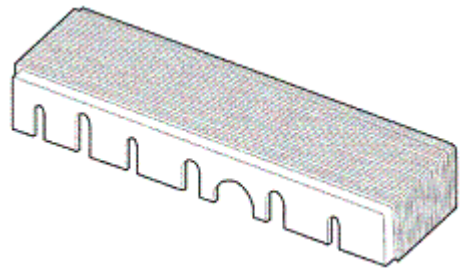
| Specification | Description |
|---|---|
| Graphics Chip | RV730Pro |
| Core clock | 600MHz |
| Memory clock | 500 MHz |
| Frame buffer | 1 GB DDR2, 128 bit wide |

| | |
|---|---|
| Maximum power | 55 W |
| Languages supported | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish |
| Operating systems support | Windows Vista Home Basic 32*, FreeDOS<br><br>* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.<br><br>Linux x86 and x86_64 distributions using XFree86 or X.Org** |

| | |
|---|---|
| | ** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: http://www.hp.com/wwsolutions/linux/products/clients/ for support information. |
| Option kit contents | • ATI Radeon HD 4650 512MB PCIe x16 Graphics Card<br>• Software CD with graphics drivers<br>• Warranty documentation |
| Compliance standards | EMC Emissions:<br>a) CISPR22: 1997/EN 55022:1998 - Class B - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment<br><br>EMC Immunity:<br>CISPR 24:1997/EN 55024:1998 - Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement. |

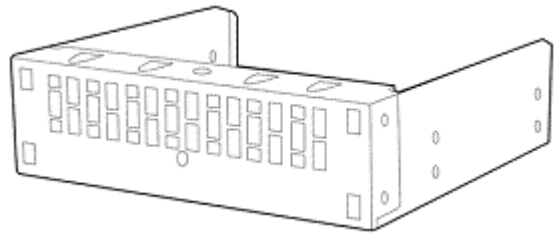
| | |
|---|---|
| HP PS/2 or USB Standard Keyboard | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11880_na/11880_na.html (Worldwide) |
| HP USB PS2 Washable Keyboard | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13395_na/13395_na.html (Worldwide) |
| HP USB Mini Keyboard | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13237_na/13237_na.html (Worldwide) |
| HP USB Smart Card Keyboard | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12346_na/12346_na.html (Worldwide) |
| HP USB 2-Button Laser Mouse | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12912_na/12912_na.html (Worldwide) |
| HP PS/2 2-Button Optical Scroll Mouse | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12490_na/12490_na.html (Worldwide) |

*Technical Specifications*

| | | |
|---|---|---|
| HP USB Optical Scroll Mouse | | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11356_na/11356_na.html (Worldwide) |
| Serial ATA 3.0-Gb/s Hard Drives (7200 rpm) | 160 GB<br>250 GB<br>320 GB<br>500 GB | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12229_na/12229_na.html (Worldwide) |
| SATA DVD-ROM Drive | | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12548_na/12548_na.html (Worldwide) |
| HP SATA SuperMulti LightScribe Drive | | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12739_na/12739_na.html (Worldwide) |
| HP 16X SATA Blu-ray Writer | | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13321_na/13321_na.html (Worldwide) |
| Port control cover | Prevent access to ports at the back of your HP Compaq Business Desktop with a rear port controller cover. |  <br>Port control cover |
| Key Benefits | • Prevent access to rear ports<br>• Enhances security and convenience | |

**HP Chassis Security Kit**

Prevent access to or removal of internal components like memory, hard drive, and power supply, particularly designed for the education market.



Chassis Security Kit

**Key Benefits**

- Protect your investment and help keep the system up and running by:
- Safeguarding the memory and hard drive with a metal bay filler
- Securing the power supply with two screws
- Preventing cable disconnection
- Locking down the front bezel so that internal components cannot be removed

---

**HP 2nd Serial Port Adapter**
**HP Parallel Port Adapter**
**HP Serial/Parallel PCI Card**

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12396_na/12396_na.html (Worldwide)

---

**HP 22-in-1 Media Card Reader**

| | | |
|---|---|---|
| **USB interface** | USB 2.0 High-speed device via PCI card or pass -through via internal USB port of system board | |
| **Advance protocol support** | • Supports hardware ECC (Error Correction Code) function<br>• Supports hardware CRC (Cyclic Redundancy Check) function<br>• Supports MS 4-bit parallel transfer mode<br>• Supports MS-PRO 4-bit parallel transfer mode<br>• Supports SD 4-bit parallel transfer mode<br>• Supports high-speed 50 MHz SD 4-bit card (version 1.1)<br>• Support high-speed 52 MHz MMC 8-bit card (version 4.x) | |
| **Supported media types** | • Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II), MicroDrive (MD)<br>• Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), xD-Picture Card (xD)<br>• Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC Mobile)<br>• Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo) | |
| **Mechanical** | **Length** (3.5″) | 124.7 cm |
| | **Width** (3.5″) | 101.6 cm |
| | **Height** (3.5″) | 25.4 cm |
| | **Length** (5.25″) | 171.6 cm |
| | **Width** (5.25″) | 148.9 cm |

| | | |
|---|---|---|
| | Height (5.25") | 42.7 cm |
| Environmental | Operational environmental extremes | Test Parameters/Conditions – Power applied, unit operating on system ±5% nominal supply voltage.<br>10°C 10% R.H. = 24 hours<br>10°C 90% R.H. = 24 hours<br>20°C 90% R.H. = 24 hours<br>30°C 90% R.H. = 24 hours<br>40°C 90% R.H. = 24 hours<br>50°C 90% R.H. = 24 hours<br>50°C 10% R.H. = 24 hours |
| | Storage environmental extremes | Test Parameters/Conditions<br>60°C @ 80% R.H. for 96 hours<br>-30°C @ 20% R.H. for 48 hours<br>No power applied<br>Delta °C < 1.0°C/min<br>Delta % R.H. < 1.5% R.H./min |
| Approvals | | USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2<br>FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T |

Copyright © 2009 Hewlett-Packard Development Company, L.P.

All rights reserved. Microsoft, Windows, Windows Vista, and Windows 7 are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. Phenom, Athlon and Sempron are registered trademarks or trademarks of AMD Corporation in the U.S. and/or other countries. All other product names mentioned herein may be trademarks of their respective companies.

The information contained herein is subject to change without notice and is provided "as is" without warranty of any kind. The warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.